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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/517,665

08/05/2005

Shigeo Shirakura

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EXAMINER

WEISZ, DAVID G

ART UNIT

PAPER NUMBER

1797

MAIL DATE

DELIVERY MODE

06/17/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/517,665	<b>Applicant(s)</b> SHIRAKURA, SHIGEO	
	<b>Examiner</b> DAVID WEISZ	<b>Art Unit</b> 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 20 March 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,4,5,8-10 and 12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,4,5,8-10 and 12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 December 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

1. Acknowledgement is made of amendment filed 3/20/09. Upon entering the amendment, claims 1, 4, 5, 8, 9, 10, and 12 are amended. Claims 2, 3, 6, 7 and 11 have been canceled.

Claims 1, 4-5, 8-10 and 12 are pending and presented for examination.

### ***Response to Amendment***

2. In response to the amendment and the Applicants' remarks, the examiner modifies the grounds for rejection and establishes objection to the specification.

### ***Specification***

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. The specification is objected to because it does not "contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same". For example, the specification discloses the following:

"According to the first mode, NO<sub>x</sub> concentrations and NH<sub>3</sub> concentrations are determined on the inlet and outlet sides of respective NO<sub>x</sub> removal catalyst layers, and the percent NO<sub>x</sub> removal ( $\eta$ ) is determined on the basis of an inlet mole ratio. Therefore, the percent NO<sub>x</sub> removal, which is enhanced as the mole ratio increases, can be valued on an absolute basis and correctly." (Pages 3 and 4) This is totally unclear. How is it possible to determine NO<sub>x</sub> concentrations and NH<sub>3</sub> concentrations at the inlet and outlet, and then determine the percent NO<sub>x</sub> removal on the basis of just an inlet mole ratio?

The equation recited on page 4 is not clear, since it is not apparent, as to why the outlet amount of  $\text{NH}_3$  is subtracted from the inlet amount of  $\text{NH}_3$ , when the amount should be bigger at the outlet than the inlet? It is also not clear, why only the outlet amount of  $\text{NO}_x$  is taken into account in the equation, when this is a decreasing amount, and not the inlet amount? It is not apparent, as to what "evaluation mole ratio" might be, and the "inlet mole ratio" of what is recited in the equation?

It is further unclear, whether the inlet amount of  $\text{NH}_3$  is in fact the outlet amount of  $\text{NH}_3$  of the previous catalyst? It is not clear, as to what would be the inlet amount of  $\text{NH}_3$  for the first catalyst - is this the amount of  $\text{NH}_3$  in the ambient air?

Applicants need to accurately define the bases of inlet  $\text{NH}_3$  and  $\text{NO}_x$  values, especially if they are based on the outlet values of a previous layer. These definitions are critical or essential to the practice of the invention, but not included in the claim(s) or the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976).

### ***Claim Rejections - 35 USC § 112***

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. **Claims 1, 4-5, 8-10 and 12** are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for an equation comprising parameters for output of  $\text{NH}_3$  from a previous catalyst layer, input of  $\text{NO}_x$  from the immediate layer and output for  $\text{NH}_3$  and  $\text{NO}_x$  in the immediate layer, does not reasonably provide enablement for the equation based on an inlet mole ratio. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to use the invention commensurate in scope with these claims. The specification does not disclose how the reaction of  $\text{NH}_3$  and  $\text{NO}_x$  over the catalyst layer produces the reduced  $\text{NH}_3$  and  $\text{NO}_x$  values, nor does it make any mention of a necessary benign nitrogen product. For the purposes of examination, the equation will be interpreted to be based on a  $\text{NH}_3$  to  $\text{NO}_x$  ratio.

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7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

**Claims 1, 4-5, 8-10 and 12** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claims disclose the determination of NO<sub>x</sub> concentrations and NH<sub>3</sub> concentrations on the inlet and outlet sides of respective NO<sub>x</sub> removal catalyst layers, and the percent NO<sub>x</sub> removal ( $\eta$ ) is determined on the basis of an inlet mole ratio. The language is unclear in that it does not discuss how it is possible to determine NO<sub>x</sub> concentrations and NH<sub>3</sub> concentrations at the inlet and outlet, and then determine the percent NO<sub>x</sub> removal on the basis of just an inlet mole ratio. Additionally, the claims disclose equation 1, however it is not apparent as to why the outlet amount of NH<sub>3</sub> is subtracted from the inlet amount of NH<sub>3</sub>, when the amount should be bigger at the outlet than the inlet. The equation also relies upon an "evaluation mole ratio" and an "inlet mole ratio" which is not clearly defined in the claims. Additionally, it is further unclear whether the inlet amount of NH<sub>3</sub> is in fact the outlet amount of NH<sub>3</sub> of the previous catalyst. It is not clear, as to what would be the inlet amount of NH<sub>3</sub> for the first catalyst – if this is the amount of NH<sub>3</sub> in the ambient air, it should be clearly stated.

### ***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

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1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

10. **Claims 1, 4-5 and 10** are rejected under 35 U.S.C. 103(a) as being unpatentable over Keizo et al (JP747108B2) (Keizo).

For the purposes of examination, equation 1 of the instant claims is interpreted to include a ratio between  $\text{NH}_3$  and  $\text{NO}_x$ . Keizo discloses an  $\text{NO}_x$  removal catalyst management unit for use with an  $\text{NO}_x$  removal apparatus having a plurality of removal catalyst layers [0004] comprising a measurement means for measuring  $\text{NO}_x$  and  $\text{NH}_3$  concentrations at each layer [0004]. The reference additionally discloses that percent  $\text{NO}_x$  removal determination means is on the bases of an  $\text{NO}_x$  ratio derived from the concentration [0005-0007]. However, it would have been obvious to one having ordinary skill in the art at the time of the invention to use the  $\text{NH}_3$  concentrations along with  $\text{NO}_x$  concentrations to form a ratio from which the  $\text{NO}_x$  removal catalyst layer efficiency could be determined, as the two values are stoichiometrically related [0007] and would provide a more accurate analysis (*claims 1, 4-5 and 10*).

11. **Claims 8-9 and 12** are rejected under 35 U.S.C. 103(a) as being unpatentable over Keizo in view of Ganeshan et al. (US 2002/0127153) (Ganeshan).

Keizo does not disclose a method of performing restoration treatment of an  $\text{NO}_x$  removal catalyst layer based on a predetermined deteriorated level.

Ganeshan discloses performing restoration treatment of an  $\text{NO}_x$  removal catalyst layer based on a predetermined deteriorated level, such as replacing the catalyst layer with a new layer [0020] (*claims 8, 9 and 12*). It would have been obvious to one having ordinary skill in the art to replace a deteriorated catalyst layer with a new layer because it would prevent  $\text{NO}_x$  levels from exceeding the proper levels.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DAVID WEISZ whose telephone number is (571)270-7073. The examiner can normally be reached on Monday - Thursday, 7:30 a.m. - 5:00 p.m., EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vickie Kim can be reached on (571)272-0579. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

6/8/2009

/Yelena G. Gakh/  
Primary Examiner, Art Unit 1797

/D. W./

Examiner, Art Unit 1797